State Water Survey Division
HAZARDOUS WASTE RESEARCH AND INFORMATION CENTER
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Illinois Department of
Energy and Natural Resources

SWS/HWRIC Report 001

HAZARDOUS WASTE RESEARCH AND INFORMATION CENTER

PLAN FOR FY '85

July 1984

ILLINOIS DEPARTMENT OF ENERGY AND NATURAL RESOURCES

HAZARDOUS WASTE RESEARCH AND INFORMATION CENTER (HWRIC)

PLAN FOR FY '85

July 10, 1984

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EXECUTIVE SUMMARY

This document describes ENR's Hazardous Waste Research and Information Center Program for fiscal year '85 with projected tasks for budget years '86 and '87. The mission of the Center is two-fold. It will provide assistance to industry, the public and offices of state and local government in meeting the challenge of effective hazardous waste management. Also, it will improve our scientific and engineering knowledge through research to both reduce the risks involved in waste generation and management, as well as to balance environmental protection with wise economic development.

The Hazardous Waste Research and Information Center (HWRIC) will coordinate research, information and assistance efforts of ENR's divisions and provide a reliable mechanism for the development of state hazardous waste management policy. Its principal program elements include:

Research - to better assess and identify solutions to hazardous waste management problems

Information - to improve the general level of understanding of the complexities, costs, risks and potential benefits which attend the issue of hazardous waste management

Assistance - to encourage industry and commerce to adopt, whenever possible, alternative technologies for the treatment and disposal of hazardous waste; and also to provide technical support to researchers and government agencies.

HWRIC activities have been planned to supplement research and information programs at the federal level with specific inputs attuned to Illinois' problems. HWRIC's goals and long-term objectives directly complement those of IEPA's related programs under the Chemical Safety Research Initiative.

The emphasis of HWRIC's initial activities will be to: act as a clearinghouse for published information on hazardous waste, expand ongoing research activities towards an improved assessment of the extent of HW management problems and to implement an effective industrial assistance effort. These activities are detailed in specific task areas which will be undertaken by program staff in the first year. As these activities develop, the focus of HWRIC programs will shift towards research investigations of critical information gaps towards the design and execution of a state hazardous waste management policy. This phased implementation approach will maximize the effectiveness and achievements of the HWRIC program.

HWRIC PROGRAM ELEMENTS, OBJECTIVES AND TASK AREAS

The HWRIC program will offer information, technical assistance, and research studies regarding the magnitude, consequences, and solutions to HW management problems in Illinois. This program is designed to complement HW management and research activities ongoing in the state and the nation. Illinois' HW problems are not unique. Established efforts at the state, national, and international levels will enhance the HWRIC program. They will not be duplicated by HWRIC activities.

To achieve the goals and objectives of HWRIC, the effort has been designed incorporating several program elements. These program elements will generate and distribute research data, and provide assistance and information of explicit value to the total program. These program elements include: Research, Information and Industrial and Technical Assistance. Shared functional elements of the Center include the laboratory and the data base management system which will support all HWRIC activities. Each program element and corresponding task areas in decreasing order of priority are described briefly below:

RESEARCH (R)

Illinois cannot resolve its complex, often unique HW problems without a strong research program. A high quality research program will incorporate problem assessment and problem solving research to address current HW management problems and to anticipate the research and information requirements to solve future problems. This program will be coordinated with related research efforts to promote solutions to HW problems.

To achieve useful research results, HWRIC must support competent scientists with adequate funding and have a program that addresses the most critical research needs. The scientific staff of ENR's Divisions: the scientific Surveys, the Energy and Environmental Affairs Division, and the State Museum, are highly qualified to conduct some of the research in important HW problem areas. The HWRIC program will also call upon the aid of scientists from both the state University system and private interests who possess skills and expertise in HW research areas. Problem Assessment (PA) and Problem Solving (PS) Research investigations will be conducted to address critical information needs as they are identified and as program phasing and support permits.

Task Areas

Problem Assessment

PA1. A retrospective analysis of the state's regional trends in hazardous waste generation, management and disposal will be accomplished, identifying major potential problem areas from past activities.

PA2. Regional studies of the extent to which Illinois ground-water resources have been contaminated will be undertaken in areas which have had a long history of industrial waste generation and disposal activity. Problems involved in determining the fate of hazardous materials in the subsurface will be defined. This will be coordinated with IEPA's developing ground-water monitoring network.

PA3. Under-regulated sources of hazardous waste release to the environment will be identified and prioritized as to the potential risk to human health via drinking water supplies. Underground storage tanks and waste water impoundments will be a part of this assessment.

PA4. Optimized monitoring strategies for ground-water resources will be developed in order to permit both more effective use of present water quality data and improved reliability of future monitoring results.

PA5. Site specific investigations will be undertaken to establish whether existing disposal sites are dangerous.

PA6. A study of the impact of the past 15 years of regulatory activity on the operation of municipal sewage treatment plants (MSTP) will begin. The study will concentrate on the sewering of wastes which have come under regulation and pose severe treatment difficulties at MSTP's.

Problem Solving Research

PS1. Methods for the determination of effective means to control subsurface contaminant plumes will be developed.

PS2. The specific needs for atmospheric resource monitoring and management as related to the generation, treatment, destruction or disposal of hazardous wastes, will be identified.

PS3. Effects of HW on terrestrial and aquatic systems will be studied to ascertain levels of bioaccumulation that may pose a threat to public and environmental health.

PS4. The geologic and hydrogeologic factors responsible for migration patterns of HW (toxic compounds) in ground waters will be determined.

PS5. Techniques for the rehabilitation of water supplies by in-situ and point of use treatments will be evaluated to deal with the economic and public health problems of contaminated water supply.

PS6. Innovative waste reduction and alternative treatment techniques will be investigated for high volume, high hazard waste streams which are currently intractable by demonstrated treatment methods.

INFORMATION (INF)

The cooperation of industry, the public, and state government are necessary components of an effective state HW management strategy. HWRIC will provide information that will facilitate environmental and public health protection in a cost-effective manner.

Information will be acquired from a wide variety of sources, evaluated by knowledgeable staff, and compiled in a manner that will expedite effective information transfer to the public, industry and government.

Identified information needs are listed below in decreasing order of immediacy and priority.

- ⊙ Planning and Policy Data are needed about: past and present sites of treatment and disposal activity, environmental consequences, and projected state needs for specifics on future treatment and disposal capacity.

- ⊙ Economic and Industrial Development requires comprehensive economic and demographic information for optimizing siting requirements, improving the efficiency of environmental regulation and facilitating public acceptance of new industries.

- ⊙ Disposal Alternatives need to be carefully researched and this information must be made available to industries which are candidates for source reduction, recyling, reclamation or other alternatives to landfilling.

- ⊙ Enforcement, Regulation Monitoring and Remedial Action Activities of IEPA and other state agencies require reliable information on improving the effectiveness of their various programs, as well as technical support for non-routine problems.

- ⊙ Educational and Technical Outreach efforts must be carefully developed, based on the best available information and modes of communication to foster cooperation with both resource protection and a strong economy in mind.

- ⊙ Siting Considerations for prospective new or expanded industrial activities must be facilitated in the pre-development stages to attract industry to the state and maintain the employment opportunities which currently exist.

Task Areas

INF1. Library and communications capabilities which currently exist will be evaluated with respect to their utility for HWRIC information activities.

INF2. The development of informational brochures on the current magnitude of the HW problem and technical workshops on the state of the art of various HW management and research topics will be undertaken.

INF3. A Data Base Management System will be established sufficient to meet the needs of HWRIC core staff and researchers for the reliable transfer and communication of information.

INF4. A workable model of the state's economic activity related to HW management activities will be developed to permit the reasoned analysis of future planning or policy alternatives.

INF5. A Geographic Information System with cartographic, map overlay and analysis capabilities will be developed to enable the facile visualization of statewide (coarse) and township (fine) level details of economic, environmental, and demographic data, as well as known sites of waste generation treatment and disposal.

INDUSTRIAL AND TECHNICAL ASSISTANCE (ITA)

This program element represents a new area of expertise of ENR's current research and services program in waste management. A small, high level engineering staff, familiar with chemical process and waste treatment engineering, can provide dedicated engineering support and assistance to Illinois industries which do not have the expertise to cope with their waste problems. The staff must be well acquainted with state of the art pollution prevention and waste reduction technologies applicable to Illinois industries and be fully aware of statewide needs for effective hazardous waste management. Support will be focussed on the reduction of HW generation by encouraging process modification, product substitution, recycling, reclamation and other alternatives to landfilling. The Center staff will rely on specialized skills available in the Scientific Surveys, the State University system or private consultants on specific problems. The staff must also aid in resolving the difficulties inherent in assessing the magnitude of Illinois' past HW problem, as well as viable options for the future.

A modern laboratory facility to support the Center's research projects, industrial assistance program and provide analytical services for the Center staff will be developed. Current laboratory facilities are

insufficient to handle samples contaminated with toxic wastes. The laboratory will ultimately be an entity which will be supervised directly by the Center Director.

Task Areas

ITA1. High volume, high hazard (risk) waste generating industries will be identified.

ITA2. Data on waste stream generating processes and waste characteristics will be collected to identify viable options for process modification, product substitution, waste reduction, recycle/reclamation potential and other alternative treatment techniques.

ITA3. Archival studies will be conducted to define trends in the type, location and nature of past industrial HW generating activities in order to project current and future needs for waste management options, as well as address the magnitude of current problems.

ITA4. Mechanisms for providing direct and indirect industrial assistance on pollution prevention and waste management programs will be developed.

ITA5. Generic site screening procedures will be applied.

ITA6. Field support and equipment to facilitate the research and assistance programs must be provided.

MANAGEMENT (M)

The efficient development and operation of the HWRIC program described above will depend on a sound management structure to support and enhance the research, assistance and information programs. HWRIC will integrate the information and assistance programs with a multidisciplinary research program. Further, HWRIC must establish contact with state, federal, and industrial entities so that, together, they may develop viable programs for the effective management of HW.

Task Areas

M1. A high quality core staff will be employed to manage the Center and to direct the programmatic activities within each of the three program elements.

M2. Facilities will be secured to house the core staff of the Center; planning and implementation of the data base management system will be accomplished.

M3. A procedures document for the administration of HWRIC programs will be developed with clearly defined procedures for managing service and research activities. The selection of the Program Advisory Panel for HWRIC will be included in this effort to involve industry, the public and government in the program.

M4. Data bases will be designed, developed and implemented to allow facile transfer of results from a number of external and internal sources, as well as to insure confidentiality of proprietary information or raw research data.

M5. A continuing mechanism for maintaining close contact with the staffs of IEPA, IDPH, IPCB, the Metropolitan Sanitary District of Greater Chicago and other state, local and regional government agencies will be developed.

M6. Communication with representatives of industry, trade groups and national organizations concerned with HW management will be developed and maintained.

M7. Laboratory facility requirements should be identified in a preliminary design plan prior to the development of a full design plan by a qualified firm.

DETAILED WORK PLAN AND IMPLEMENTATION STRATEGY

FY '85 WORK PLAN

Administration and Program Management

Program elements, goals, objectives and task area priorities have been identified for the HWRIC effort. The task area priorities in this plan were assigned to either Phase 1 (FY '85) or Phase 2 (FY '86 and beyond) on the basis of the average ranking provided by the planning committee. The task areas chosen for Phase 1 provide a valuable basis for initial HWRIC implementation, given the projected level of funding. As HWRIC develops, its capabilities for information/industrial assistance and assessment research, we expect that the focus of future activities will be sharpened. HWRIC management will have a better idea of the state's research, information and assistance needs and would be expected to redirect available resources accordingly. If the currently projected funding level in the out-years materializes, the expansion of ENR's laboratory and research capabilities in HW will be supported by new facilities as well as a shift towards funding more research projects identified in the task areas.

Management Plan. The ultimate success of HWRIC, as a focus for research and information on hazardous wastes in Illinois, will depend on a strong and accountable management structure. It will equally depend on a high level of coordination and interaction between its research, assistance, and information programs and amongst its diverse research projects. The management plan is designed to accomplish these goals.

The management structure for HWRIC is displayed in Figure 4.1. The Center will be administratively directed by the Illinois State Water Survey which will serve as the host Division for HWRIC. The Policy and Program Governing Board will help develop and approve the policies, programs, and related financial plans for HWRIC. The Chief of the Water Survey will chair this Board, answer to the Director of ENR, and provide direct supervision of the Director of HWRIC.

The Center Director will be advised by an external Program Advisory Panel comprised of representatives of the concerned industrial sector, local and state entities, and from the university sector. This group will provide an overview and input on HWRIC plans and performance. The Internal Advisory Committee will consist of representatives of each Division of ENR. This group will help provide scientific and technical guidance and facilitate staff interactions.

The Director of HWRIC will supervise the leaders of the three main elements, the Research Program, the Industrial and Technical Assistance Program, and the Information Program. The Research Program Coordinator (RPC) will convene an Investigators Committee to ensure cooperation on joint research activities and to plan for potential interaction in field studies. The RPC will provide planning, guidance, and direction, of all the research endeavors of HWRIC. This includes the focussed research on problem assessment and problem solving research of HWRIC staff and that

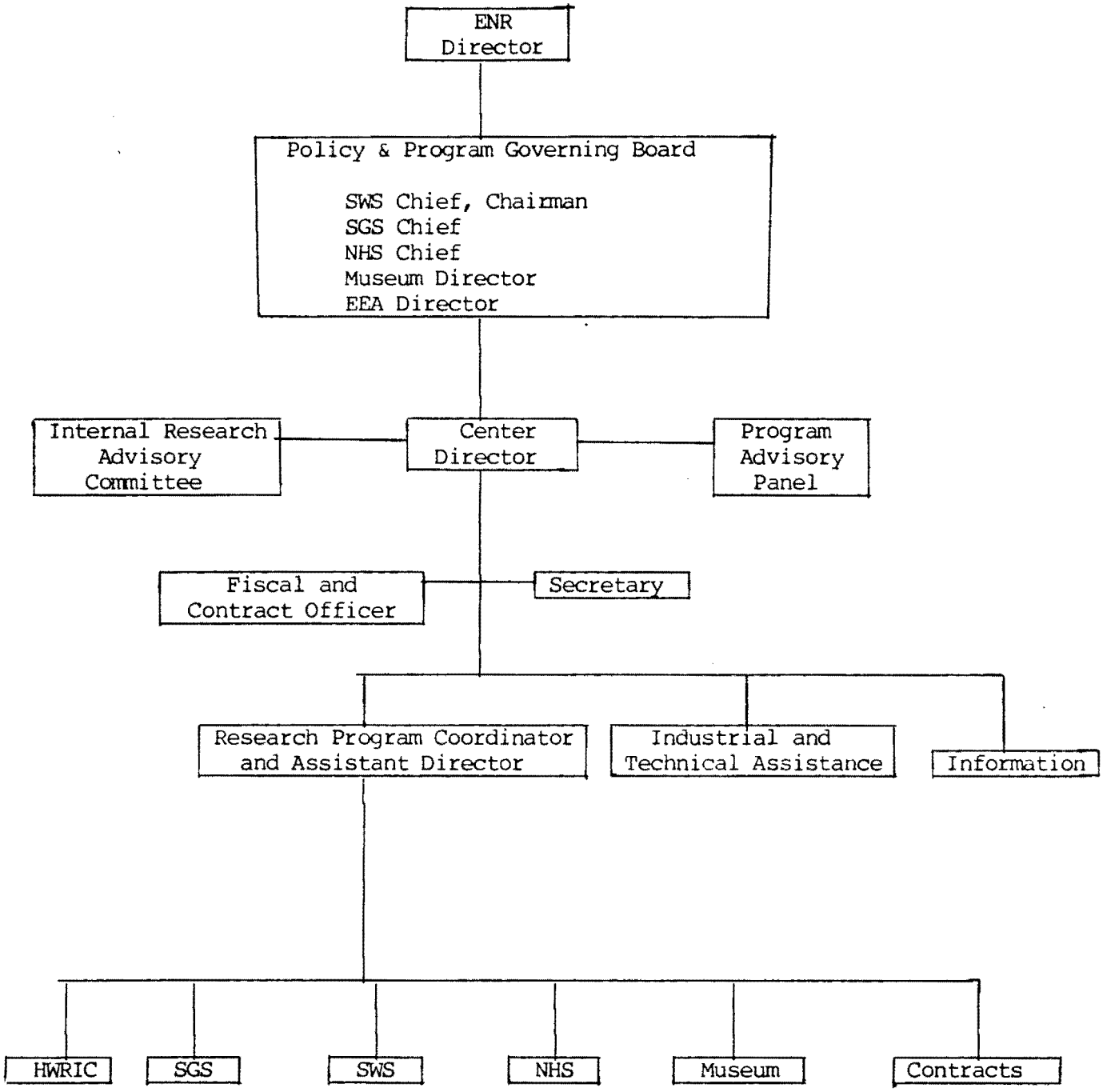

Figure 4.1. Management structure of HWRIC

of the ENR Divisions, and the research projects funded by contracts with public and private sector scientists.

Center Staffing. All HWRIC core and Divisional staff will be selected by appropriate levels of recruitment (national or local) and evaluation of the applicant's capabilities in the light of each position's needs. Satisfactory candidates would be presented to the Board of Natural Resources and Conservation for final approval of their appointments to Division staff. Board approval will assure that technical competence and professional demeanor are the primary criteria for appointment. The complex nature of HW issues demands that HWRIC positions at least approach the salary levels offered by the private sector for equivalent expertise. High level personnel will provide HWRIC with the capability and momentum to make the program a continuing success. The staff detail is shown in Table 4-1 for the HWRIC core and Divisional staff. Position descriptions are contained in Appendix 1.

The core staff housed at the Water Survey will largely consist of scientists and environmental engineers. The Director will be a top environmental scientist experienced in management. The 2-person staff of the Industrial and Technical Assistance program will be experienced environmental engineers. The 3-person staff of the Information Program will include two scientists and a data systems specialist who will be located in Springfield. The Research program will include the Coordinator and two associate research scientists. The core staff and all HWRIC endeavors will be supported by a secretary and a financial and contracts officer.

The non-core research staff of HWRIC will be located in four ENR Divisions (3 scientific Surveys and the Museum). They will focus initially on the top priority problem assessment research projects.

As the information and technical assistance efforts mature, increasingly more support will be available for specific research projects. Contract supported personnel in a variety of disciplines will extend the impact of HWRIC's activities in order to more fully meet the state's needs towards the development of HW management policy. Research projects specific to these needs will grow more diverse, reflecting the clearer definition of problem areas within ENR's mandated research and information roles.

The complex nature of HW management problems and the environmental impacts of improper waste handling should provide ENR scientists with many fruitful opportunities for scientific inquiry through HWRIC. It should in no way limit the realm of potential projects in the Divisions.

HWRIC Staffing, Task Area Responsibilities, and Budget. The staffing and budget requirements to pursue all the research and information needs which have been identified far exceed the projected funding level for FY '85, '86 and '87. Prioritization of the task areas has permitted the selection of high priority tasks for Phase 1 efforts (initiated in FY '85) and those which must be delayed until FY '86 and beyond in Phase II. Phase 1 will permit the development of the information and industrial assistance efforts and provide the basis for problem

Table 4.1. HWRIC Core and Divisional Staff Detail

Position	Equivalent Survey position level
Core	
1. Director	Professional Scientist
2. Fiscal and Contracts Officer(1)	Assoc. Prof. Sci.
3. Administrative Assistant/Secretary	Assoc. Supp. Sci.
4. Research Program Coordinator*	Professional Scientist
5. Research Scientist	Assoc. Prof. Sci.
6. Research Scientist/Data Systems	Assoc. Prof. Sci.
7. Industrial Assistance Coordinator*	Professional Scientist
8. Industrial Assistance Engineer	Professional Scientist
9. Information Program Coordinator*	Assoc. Prof. Sci.
10. Data System Specialist (EEA)	Ass't. Prof. Sci.
11. Information Specialist	Ass't. Prof. Sci.
Divisional	
1. Research Scientist (ISWS)	Ass't. Prof. Sci.
2. Research Scientist (ISM)	Ass't. Prof. Sci.
3. Research Scientist (ISGS)	Ass't. Prof. Sci.
4. Research Scientist (ISNHS)	Assoc. Prof. Sci.

(1) This staff position to be negotiated as to source of funding.
* Group Leader

Table 4.2. HWRIC Current Level of Appropriation

Line Item	Source of Funds ($K) GRF	CDB	PUF	HWRF
Personal Services	331.5			
Travel	14.0			
Commodities	12.5			
Printing	8.0			
Equipment	27.0			
SUBTOTALS	393	0	0	0
Capital Planning Funds		200		
Contractual Research and Services necessary to carry out HWRIC activities	407	0	200	300
TOTALS	800	200	200	300
OVERALL	$1.5M			

assessment research. Once these initial tasks have been addressed, the Phase II effort will begin with a shift in HWRIC resources towards more problem solving research. The task area phasing shown in Figure 4-2 provides a general framework of HWRIC activities, which should carry the program from Phase I into Phase II during early FY '86.

In the first year of HWRIC operations, all core staff will be deeply involved in the development of several important data bases and the establishment of both information transfer and industrial assistance capabilities. These efforts will provide ENR with critically needed, high visibility products. They will enable an improved focus for continuing research, information clearinghouse and assistance efforts and base future HWRIC activities on a solid foundation.

A detailed series of task area activities for management and each of the program elements is presented in Figures 4-3 through 4-6. The principal products expected in Phase 1 are also provided. Inspection of these figures clearly shows the central importance of task areas INF1, INF2, INF3, ITA1, ITA2, ITA3, and ITA4. Task Area PA1 is indeed one of the most crucial and involved of the research needs identified. The interrelationships among the program elements will demand daily interaction among HWRIC core staff to sustain program direction and consistency once the needs of the state have been more carefully identified.

Budget considerations for HWRIC activities are complicated by the mix of funds which make up the projected level of overall support and the uncertainties involved in the timing of recruitment, staff relocation and task progress. Several assumptions have been made to prepare a tentative budget. These qualifying assumptions include: the need for close integration of information clearinghouse activities and the technical assistance and research activities, as well as the need for a visible base of operations for the majority of core staff to sustain program direction and consistency. Also, the outcome of the legislative session and the lag involved in salary expenditures due to the need to recruit and relocate candidates for the core and Divisional staff demands flexibility in the budgeting process. Available support for HWRIC is shown in Table 4.2, detailing the current (June 22) level of appropriation in various line items.

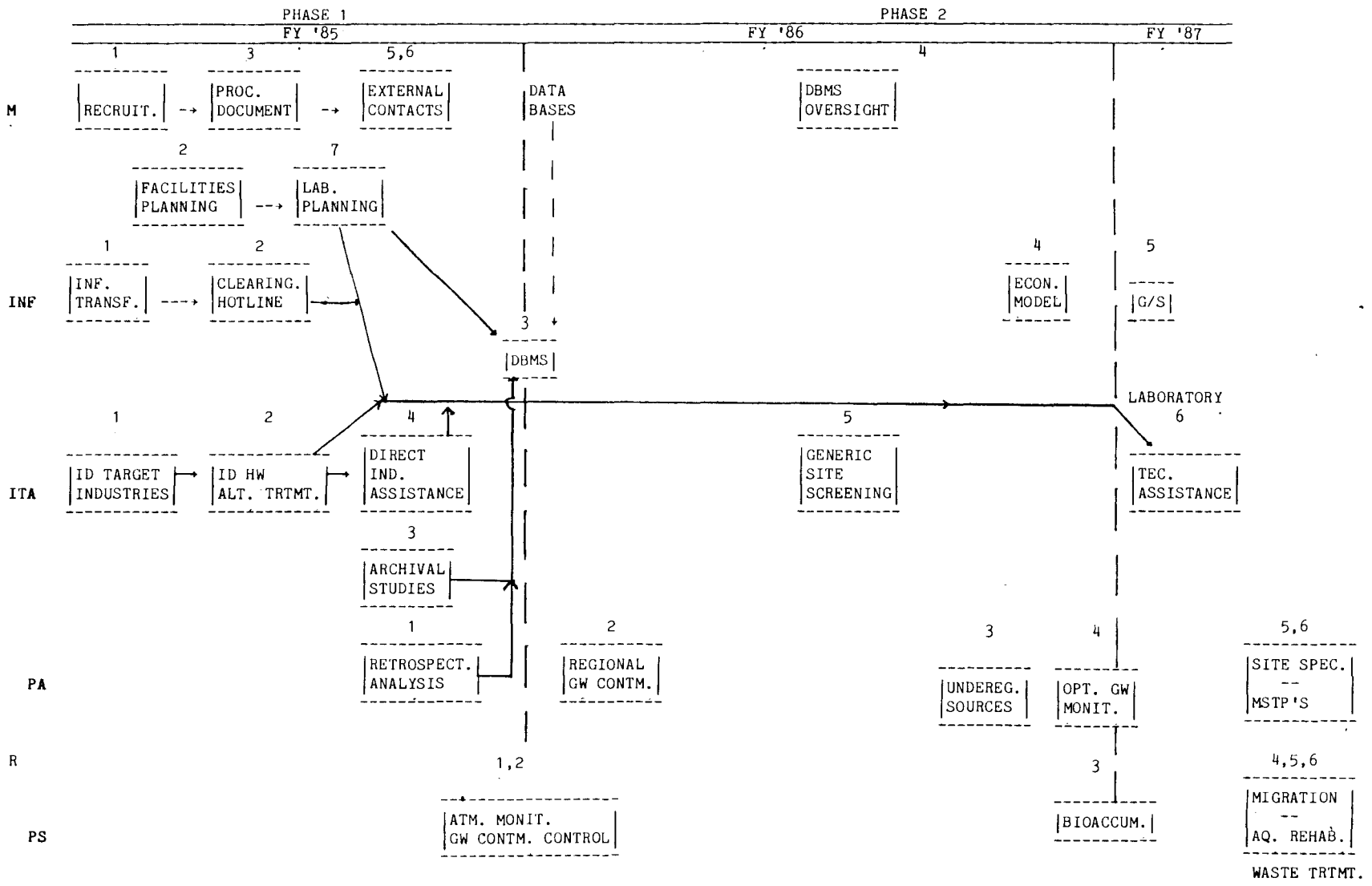
PHASE 1
PHASE 2
FY '85
FY '86
FY '87
M
INF
ITA
PA
R
PS
RECRUIT.
PROC. DOCUMENT
EXTERNAL CONTACTS
DATA BASES
DBMS OVERSIGHT
FACILITIES PLANNING
LAB. PLANNING
INF. TRANSF.
CLEARING. HOTLINE
ECON. MODEL
G/S
DBMS
LABORATORY
ID TARGET INDUSTRIES
ID HW ALT. TRTMT.
DIRECT IND. ASSISTANCE
GENERIC SITE SCREENING
TEC. ASSISTANCE
ARCHIVAL STUDIES
RETROSPECT. ANALYSIS
REGIONAL GW CONTM.
UNDEREG. SOURCES
OPT. GW MONIT.
SITE SPEC. -- MSTP'S
ATM. MONIT. GW CONTM. CONTROL
BIOACCUM.
MIGRATION -- AQ. REHAB.
WASTE TRTMT.

Figure 4.2

HWRIC PROGRAM MILESTONES AND PRODUCTS

Program Element Management		FY '85, '86, '87 '84 2 3 4 5 6 7 8 9 10 11 12 FY'86 FY'87	Products
M1	Recruiting	----------→ 14 FTE's - - - -→ 2 FTE's - → 1 FTE	High quality core staff
M2,7	Facilities Planning Laboratory	Temporary Office Space --------→ A/E Plans . Internal Plan Contractor Selection Design Constr. -----→ ----------→ Study Lab.	Base of operations facility
M4	Data Base Management (Joint with INF1,3; ITA1,3 and PA1)	Internal ------→ Contractor Data Processing Equip. Acquisition ----------→ - - -

HWRIC PROGRAM MILESTONES AND PRODUCTS

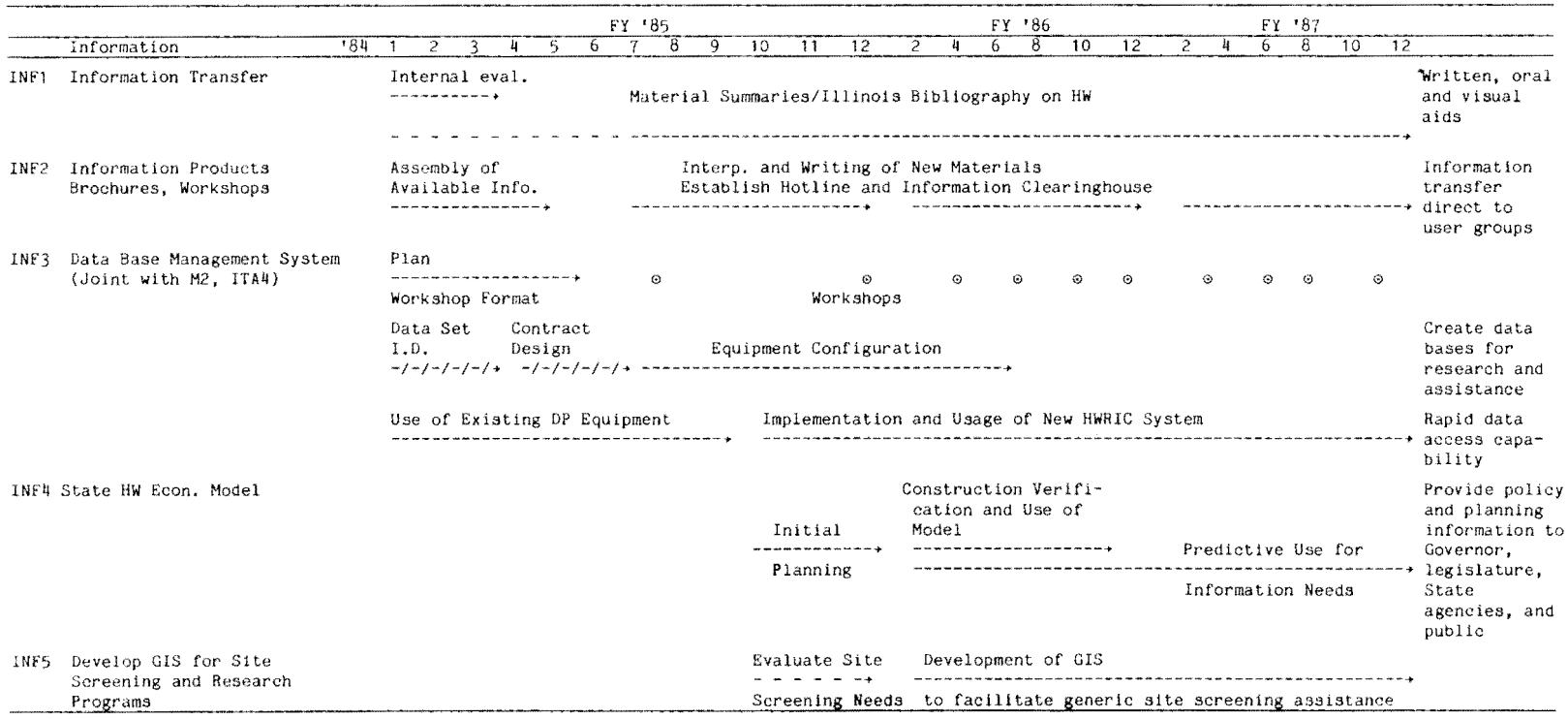

Figure 4.4

HWRIC PROGRAM MILESTONES AND PRODUCTS

Indus. and Tech. Assistance		'84	FY '85 1 2 3 4 5 6 7 8 9 10 11 12	FY '86 2 4 6 8 10 12	FY '87 2 4 6 8 10 12	
ITA1	I.D. High Risk, High Volume Generators		----------			Better definition of the HW problem
			Implement Industrial Assistance	Targeted Firms, Demonstration Projects		
			- - -

HWRIC PROGRAM MILESTONES AND PRODUCTS

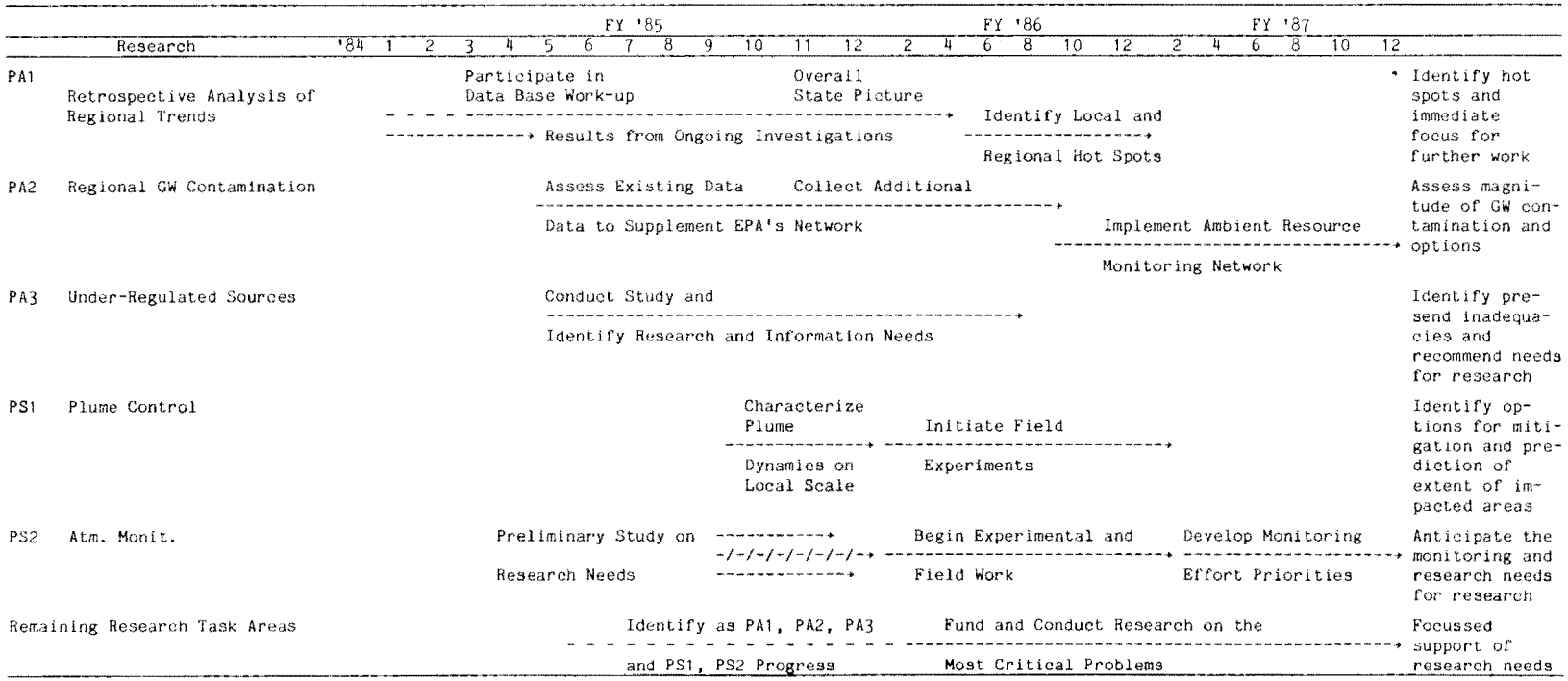

Figure 4.6

Research

The research component of HWRIC will fill information gaps relating to the generation management, treatment and disposal of HW in Illinois. The primary goal of the research program is to conduct studies in HW problem identification and solution.

Objectives

To conduct research that will:

1. Accurately assess the magnitude of HW management problems, their consequences, and identify options for their solution,

2. Aid in the siting of safe treatment and disposal facilities,

3. Mitigate the environmental impacts of waste management activities, and

4. Identify and project future information and research needs of the state.

Research studies will be initiated in Phase 1 (FY '85, '86) and will merge with more focussed investigations as the program develops in Phase II.

Problem Assessment

The primary purposes of problem assessment are to determine the location and magnitude of problems associated with HW generation, management, and disposal in the state. Understanding of past disposal activities, present and future generation of HW, and reduction and alternative disposal methods are important milestones towards the development of a HW management strategy. Limited investigations of these problems have been completed recently. Expanded research activity is needed to supplement the "disposal" oriented thrust of federal programs such as RCRA and CERCLA (Superfund) and attack HW problems at the source.

To properly assess HW problems in the state and to identify those areas that represent the most immediate threat to public and environmental health requires a verifiable foundation of current information, coupled with sound scientific and engineering interpretation. Assessment studies will involve verification and interpretation of historical records, field and laboratory studies, and a thorough review of both current practice and viable options for alternative methods of HW management. The following questions are central to the task of problem assessment research investigations, some of which have been raised by past studies conducted by the Illinois Legislative Investigating Commission and the Attorney General's Task Force on HW, among others.

1. Which major types and volumes of HW streams are being generated within Illinois?

2. What are the locations of these generation sites?

3. Are waste management methods, whether on or off site, adequate for the containment of HW?

4. What are the locations of known, or abandoned disposal and spill sites?

5. What areas of the state have been impacted by improper HW management practices?

6. What are the mobile, toxic and persistent components which need to be addressed at these sites?

7. What media and routes of exposure to toxic materials present the most immediate threat to public and environmental health?

8. What complications arise from proposed alternative disposal methods?

9. How can the subtle consequences of HW release and exposure be measured reliably?

10. Can we identify predictable long-term effects on humans or the environment resultant from various waste management or disposal activities?

Problem Solving

Research will focus on three general areas: (1) methods to accurately monitor and assess HW levels in air, water, and soils; (2) procedures to mitigate the impacts of HW presently in problem disposal sites; and (3) alternative methods for production, handling, and disposal that will significantly reduce HW management risks and impacts on the environment.

Questions of interest to these investigations include:

1. What are the most effective means by which the risk of exposure to hazardous components to wastes managed in the past can be reduced?

2. What potential exists for recycling, reuse, treatment, or elimination of HW at the points of generation?

3. What procedures are most effective for <u>in-situ</u> mitigation of HW impacts on ground-water resources at known sites of contamination?

4. How can we effectively plan for the conservation of landfill capacity and contain the inevitable residues of waste treatment operations?

Project Selection

Research projects initiated during phases 1 and 2 shall be those that address the most critical and immediate aspects of HW problems in Illinois. Effective HW management policy depends upon accurate and reliable data. Data bases on waste generation processes, alternative treatment processes, and disposal procedures must be acquired, generated, and analyzed to aid in the development of appropriate strategies for HW management. The fates of HW components in the environment are poorly understood. The development of capabilities to measure and predict the transport, transformation, and ultimate fate of both specific and generic HW in the environment is an important step in determining manpower allocation and resource monitoring needs. Feasible methods for remedial action for contaminated air, water, and soil resources will also eventually receive attention to aid IEPA in their programs.

Two principal types of research projects will be initiated in HWRIC's initial phases. These include both immediately productive, as well as long-term, projects. Regardless of the time frame, they will include extensive literature reviews, sound experimental design, and definable products at the conclusion of the project. Research proposals will be evaluated by internal and external peer review to insure that related efforts at the state and federal level are not duplicated. In line with the past administration of the Hazardous Waste Research Fund, state support will be limited initially to studies which: address Illinois' most critical needs, anticipate future information gaps and avoid crisis-oriented efforts which are more properly the responsibility of regulatory agencies. Projects will be funded as cooperative agreements and include the active coordination of HWRIC core staff of the research activities. This level of research integration is necessary to maintain program direction. HWRIC research activities will supplement the industrial assistance component of HWRIC by providing information on the efficacy of alternative processes and procedures. Most importantly, the research efforts will contribute significantly to our understanding of the complexities of HW management issues in the state.

Candidate projects for HWRIC research activities will be selected on the basis of high-priority information needs identified in the problem assessment research which will begin immediately. Investigators who contributed original preproposals to the January 1984 ENR HW Research Plan of Action will be contacted to develop full project plans and budgets.

FY '85 Research Objectives

The HWRIC research program will satisfy immediate data and information needs, some of which have been mandated by law, as well as the long-term research needs of state HW management strategy. Therefore, high priority, short-term problem assessment projects will be supported in the first year in order to approach the large numbers of unknowns in: past HW generation and disposal patterns, current generation and management practices, and the impacts of ongoing waste generation and disposal activities on natural resources. A status report on HW management in Illinois to the House of Representatives' Hazardous Waste Advisory Commission is also required by legislation passed in 1983. It is anticipated that these tasks can be accomplished with a mix of Center core and Divisional staff time, supplemented by cooperative agreements with contractors. Problem assessment research will be undertaken in the first year to develop the understanding needed to formulate meaningful solutions to recognized problems and to lay the foundation for more directed future action. Of necessity, these projects must incorporate a degree of sensitivity to the serious need for program planning, design and management for a variety of users. Certain projects dependent on the availability of safe handling and analysis of hazardous wastes must await the construction of the Hazardous Materials Laboratory.

Task Area PA1 involves the integration of a multidisciplinary research effort which will involve most of the core and Divisional staff in the first year of HWRIC operations. A large amount of primary data exists on HW generation, locations, management practices, alternative treatment options and environmental impacts. However, it has not been collected into relational data bases which would enable in-depth scientific interpretation and lead to recommendations for state waste management goals.

It is important that parallel efforts proceed simultaneously in PA1 sub-tasks. These efforts will provide both an overall estimate of state HW management problems, practices, trends and consequences, as well as detailed studies of high-volume, high risk waste generation, etc. at the regional/local scale in areas of sustained industrial activity.

Currently available data on HW related industries will be obtained from regulatory agencies, primarily IEPA and the Metropolitan Sanitary District of Greater Chicago. Available reviews of HW issues completed in the past five years will be used to identify industries, regional areas and issues which demand in-depth efforts and provide a basis for the careful estimation of statewide industrial, environmental, and economic indicators of HW related activities. This information will be collected in the relational data bases (described in the Information Program description which follows this section) to permit HWRIC to accomplish two main goals. The first of which is to focus its research, industrial assistance and information activities where they can achieve the best results. The second goal is to develop the capabilities to provide the ongoing planning and policy input which state government will need to develop an effective HW management strategy. In this way,

HWRIC can meet its legislative mandate to the Hazardous Waste Advisory Commission and lay the foundation for an effective long-term program of research and services.

Candidate research projects for Phase 1 include the following from the January 1984 Plan for Action:

Hazardous Organic Compounds in Illinois' Ground Water

Delineating Areas Potentially Affected by HW Lagoon Disposal Activities in Illinois

Determining Spatial Density of Monitoring Wells for Regional Evaluations

Atmospheric Measurements of Toxic Wastes

Hydrologic Control and Plume Delineation at Experimental Aquifer Plots

Subsurface Treatment for Reclaiming Contaminated Ground Water: Feasibility and Design Guidelines

Microorganisms for Decontamination of Soil and Ground Water

Additional projects which pertain to the information needs identified in task areas PA2, 3, 4, 5, 6 and PS4, 5, 6 will also be given due consideration when funding and support facilities permit.

Information

Information development, interpretation and transfer are central to the goal of the Information Program. Phase 1 activities in this program element will commence very early in HWRIC's operations.

The Information Program will coordinate the information transfer and data management activities of HWRIC. These capabilities are the mainstays of HWRIC's approach to the development of a hazardous waste management strategy for Illinois. Technical studies conducted by core staff, outside contractors and other agencies will be evaluated and maintained in relational data bases to provide reliable information towards: policy development, research and assistance program planning, technical support for industry and government agencies and the evaluation of future options for HW management in Illinois.

There are two major areas of activity for this program element: Information Clearinghouse and Data Base Development and Management.

Information Clearinghouse

The general public's level of understanding of HW issues is limited, despite the fact that there has been a large amount of media coverage and scholarly activity on specific problems. Information transfer in layman's language is important to the effectiveness of HWRIC efforts with the public and the legislature. In addition, there are large bibliographic compilations available to encourage industrial entities to adopt waste reduction and pollution prevention programs. INF task areas 1 and 2 address the clearinghouse activities which should include both:

> Printed matter, brochures, research summaries and newsletters to supplement existing information on waste generation, disposal or treatment options, management alternatives and environmental consequences of waste handling practices.
>
> Seminars and workshops at various levels of technical detail to put the major public, environmental and economic aspects of HW management in perspective. The exchange of views, concerns and promising approaches to HW problem solutions can be most fruitful.

ENR has access to much of the relevant published literature which generally discusses HW issues. These materials will be distributed along with lists of principal Illinois contacts for specific information and advertise the HWRIC "HW HOTLINE" so that information needs can be filled on a real-time basis. Information materials will be constantly updated and communications will be facilitated between Champaign and Springfield. In this way the interactions between technical support, research and information specialists within HWRIC and cooperating groups will be assured.

In addition, at least two workshops will be planned and presented during Phase 1 with as many as four such events in FY '86. The excellent outcome of the recent workshop "Pollution to Profit: Reducing Industrial Waste in Illinois" provides encouragement for the success of these efforts.

Data Base Development and Management

Data management activities will be supported and structured to enable rapid internal communication between HWRIC program elements and outside user groups. INF Task Areas 3, 4, and 5 will be pursued jointly with a number of related HWRIC tasks, including ITA1 and 3, PA1 and M4. The need for four fundamental data bases for HWRIC activities is clear at the present time. These include:

1) A bibliographic data base consisting of: listings of major ongoing activities at the state and federal level with contact persons and available referral services and general, as well as technical, references pertaining to specific aspects of HW management issues;

2) An engineering data base on current and developing HW treatment, recycling and management practices at the national level with a subset on Illinois HW generation;

3) An historical data base on Illinois' HW generation trends, locations and characteristics with an emphasis on the disposition of the wastes and waste disposal sites; and

4) A data base of economic, environmental and demographic information available for planning, siting and decision-making purposes.

The foundation for the latter base has been implemented in the Energy and Environmental Affairs Division. There is a need to expand the geographic facets of the data base to include: the Illinois Metropolitan Map Series/Vicinity Map Series, U. S. Census Bureau map series and the Dun and Bradstreet EDMI business data base. The completed data base will ultimately permit geographic referencing of: HW generation/disposal sites, resource monitoring installations and population centers which are major variables in the overall picture of Illinois HW management. The Department's combined Regional Economic Impact (REMI)/Illinois Forecasting and Simulation Model (ILFS) or the Social and Economic Impact Model (SEAMS) can be used to evaluate the diverse impacts of various HW management strategies.

The work involved in setting up data bases 1), 2) and 3) has also begun in EEA. The first two efforts will require mainly data system structuring and software development which with sufficient support should be fully implemented in Phase 1. The historical data base 3) will take far more primary data collection and interpretation of regulatory information from IEPA and the MSDGC. Detailed data collected in the last five years must be concentrated on before the reliability of using various hindcasting strategies based on production, employment or census statistics can be assessed. This effort will be expanded in Phase 1 from the previously HWRF-supported problem assessment research projects in five NE Illinois counties. The work will be done jointly with core staff in the Research and Industrial and Technical Assistance programs with the involvement of at least one outside contractor. It will probably continue on into Phase II of HWRIC operations. The project was to have started in FY '84, however the resources of the HWRF were held back to permit HWRIC's scope and work plan to develop.

Industrial and Technical Assistance

The Industrial and Technical Assistance program element consists of two main efforts: Industrial Assistance and Engineering and Analysis. Industrial Assistance activities (ITA Task Area 4) will be developed using EEA's existing Energy Engineering Services program as a model. Indeed the two efforts should complement each other substantially, since HW management options must take into account a variety of economic constraints and energy costs in particular. The Energy Engineering Services effort has established extensive industrial facility and trade

group contacts which will facilitate HWRIC's Industrial Assistance efforts. We have met with major trade group representatives and discussed HWRIC's objectives and proposed activities. Their response was most encouraging and we expect that our assistance program will develop rapidly in Phase 1.

Initial tasks in this program component center around high-level information dissemination and the development of liaison activities with high-volume, high risk sectors of Illinois' industrial economy. ITA will coordinate both the initial assistance efforts targeted towards appropriate industries and the development of direct assistance to specific industrial concerns by HWRIC engineering staff.

Workshops, self-audit procedures for materials' flows in HW generating industries will be planned and executed. In-depth direct assistance in Phase 1 will be limited to on-site audit confirmation, consultation and referrals to expert process and waste treatment engineering consultants available in the State University system and private firms. Also, under Task Area ITA5 generic site screening procedures will be developed to aid the siting of safe HW management and treatment facilities. This effort will be limited to pre-development assistance on site requirements and concerns. It will be conducted in cooperation with the industry and appropriate regulatory bodies. Detailed site evaluation will not duplicate current activities of the Scientific Surveys or involve HWRIC in permitting concerns.

Engineering and Analysis

This program element is a small, but important, component of assistance activities. Currently the expertise needed for the engineering and analysis effort in the Center is not available in ENR. EA staff will provide support services and engineering advice to both the Information and Research Programs.

In Phase 1, staff will aid in the correlation between waste generating processes and waste characteristics for the primary data collection effort and provide the basic waste treatment experience necessary to promote waste reduction recycling or alternative waste treatments for industrial assistance as described in the preceding section. The engineers will further significantly improve the usefulness and impact of the information clearinghouse and data management activities of HWRIC. Thus, in Phase 1 ITA staff will work closely with core staff in all of the program elements, though their primary responsibilities will be to develop information transfer support mechanisms (Task Area ITA2,4)and procedures for conducting industry-specific HW management audits.

A very valuable product in the first year will be the identification of viable alternatives to landfilling of liquid hazardous wastes to aid IEPA in enforcing the legislated ban after January 1, 1985, affecting the disposal of such materials. The ban on HW solids' landfilling in 1987 will be a priority task for EA staff as well.

The full participation of ITA staff in technical support roles must await the construction of a suitable Hazardous Materials Laboratory. This facility, to be planned during Phase 1, will permit the staff to characterize waste streams for recycle, reuse and alternative treatment methods and support the needs of future demonstration projects with cooperating industries. The laboratory should also extend technical support to HWRIC research projects and the specialized needs of IEPA for the analysis of highly toxic materials or unknown samples of contaminated soil, biological tissue or water. ITA staff will have role in coordinating laboratory planning which will be conducted in Phase 1 (Task Area M7).

The first step in planning the laboratory will consist of an internal feasibility study of program needs, facility requirements, instrumentation needs and to what extent existing analytical support in the Divisions can be used for HWRIC support. The most critical consideration which sets the Hazardous Materials Laboratory apart from existing laboratories in State government is that highly toxic materials or unknown samples cannot be handled safely in current laboratories. The safety of laboratory and office personnel must be given utmost consideration. The needs of the IEPA for this type of specialized laboratory facility will be taken into account. At least two existing high-hazard laboratories in the U.S. will be visited to gain first-hand information on the advantages of various levels of personnel protection.

The feasibility study results will then be developed into a request for proposals to highly qualified laboratory design contractors. We anticipate that qualified contractors will be called upon to provide at least two detailed options for the construction of the facility to include a medium to high hazard material laboratory and one which will permit handling and characterization of medium to extremely hazardous materials (e.g. Dioxins). The feasibility of contracting out specialty analyses on extremely hazardous samples will also be explored.

It is imperative that the planning process be initiated as soon as possible to insure that state research and assistance efforts can rely on rapid physical and chemical characterization of HW waste streams. Currently, laboratory facilities available to IEPA, IDPH and ENR are inadequate to the task of complete analysis of HW waste or contaminated materials.

FY '86, '87 PROJECTIONS

The Hazardous Waste Research and Information Center should be well established in FY '85, provided that support levels are adequate to address the high priority tasks which have been identified. To some extent, HWRIC phasing will depend on the active cooperation of the Divisions, various state and local government agencies and industry. At the close of Phase 1, the Center will represent the focus of research, information and technical assistance strengths in Illinois to attack HW management problems at the source. We anticipate that sufficient progress can be made in FY '85 to enable the initiation of Phase II task area activities in FY '86.

HWRIC is an ambitious program with the potential to make real advances towards the development of an effective state HW management policy. The visibility of the program will surely encourage the comment, criticism and support of a large number of concerned groups. As problem assessment work proceeds and the information transfer and assistance programs develop, support will shift towards focussed problem solving efforts which respond to new demands as well as problems that are currently unrecognized. Therefore, planning of Center activities in FY '86 and beyond must await the development and external reactions to the program.

A tentative budget for the period FY '85 to FY '89 has been prepared which should provide the flexibility needed to fulfill high priority research, information and assistance needs and the continuing support required to sustain fundamental efforts as priorities change. Based on program progress and the results of the Phase 1 work, individual budget lines may change. However, the base level support projected for the first five years of HWRIC operations is shown for planning purposes. Operation costs adjusted for inflation should remain relatively constant, except for laboratory construction and maintenance. This budget is detailed in Table 4.3.

Table 4.3. Project HWRIC Operations Costs ($K)

Line Item	FY-85	FY-86	FY-87*	FY-88	FY-89	Total
Personnel	332	445	480	525	575	2,357
Hazardous Materials Laboratory	220	150	1,500	400	450	2,720
Research	728	810	900	1,250	1,410	5,098
Information and Technical Assistance	220	405	350	375	425	1,775
TOTALS	1,500	1,810	3,230	2,550	2,860	$11,950

* Projected Year of Laboratory Construction

CURRENT DIVISIONAL ACTIVITIES

The Energy and Environmental Affairs Division (EEA), through the Hazardous Waste Research Fund Program, has already started the development of state of the art technology information for Illinois industry. The program has concentrated on the development of process information alternatives for specific Illinois industries.

The planning and forecasting activities within the Division include collecting and maintaining comprehensive data bases on energy and other natural resources, environmental, economic and social. EEA has acquired and maintains several economic forecasting models for use in conducting policy for energy and natural resources related issues. EEA also has been offering technical assistance for Illinois industry on energy use and conservation issues for over three years. Coal technology development assistance is offered through the Coal Bond Fund Program.

The Division further conducts a siting assistance program for sponsors of major energy-related projects. Preliminary screening of sites has been done in the southern half of the state, incorporating the resources required for specific projects, as well as geographic, ecological, environmental, infrastructure and other considerations in locating fuel processing or power generation facilities.

The waste research program at the Illinois State Geological Survey evolved out of the service activities related to siting of waste disposal facilities. It is estimated that Survey personnel have provided about 2000 evaluations of proposed and existing waste disposal sites in Illinois for state regulatory agencies, local governments and industry since the 1940's.

In addition, 18 disposal sites have been, or are being studied in detail, in a wide variety of geologic settings across the state. The results of these studies provide information on the actual behavior of the complex leachates in a real world setting, and have provided information necessary for rules and regulations of waste disposal facilities.

Exploratory studies have been conducted into the geochemical interactions of the wastes and their leachates with the geologic material in which they may be placed for disposal. These studies have included municipal leachates in which heavy metals were present; metal-soil interactions, solubility and mobility of some organic substances such as polychlorinated biphenyls (PCB's).

The Geological Survey has produced 109 research reports on waste disposal and related subjects. It is recognized widely for waste disposal research.

Major ongoing projects include:

A Study of Trench Covers to Minimize Infiltration at Waste Disposal Sites: The objectives of this research program are: 1) to provide basic information on the characteristics of material which can be used in construction of waste trench caps; 2) to study the interaction and possible combinations of these materials, which will limit water from precipitation infiltrating through the wastes; 3) to test under field conditions the most promising trench cover designs; and 4) to recommend criteria and procedures for review of trench cover designs.

Investigation of Failure Mechanisms and Migration of Industrial Chemicals at Wilsonville, Illinois: The project is part of a long-term study of the suitability for waste disposal of various hydrogeologic environments in Illinois. Based on the results of this and previous studies, an evaluation of site investigation methods and the use of predictive models for describing pollutant migration will be undertaken.

The Illinois State Museum serves the people of Illinois, not only through its exhibits and public programs, but also as a collections repository and center for the study and interpretation of Illinois' natural and cultural history. A major part of this work has been the cataloging of locality data on significant plant and animal population, fossil deposits, and prehistoric archaeological sites in the state. These data bases permit the museum to assist in industrial siting processes by providing information on the nature of and location of Illinois' prehistoric past. In many instances, present federal law requires attention to the assessment and possible mitigation of prehistoric sites prior to land modification. The museum is currently conducting a pilot study of the methodology for assembling historic profiles of existing and abandoned industrial disposal sites.

The Illinois Natural History Survey has a history of research on hazardous wastes and the impacts of toxic materials on aquatic and terrestrial ecosystems. Survey scientists have conducted extensive and intensive laboratory research addressing the problems associated with heavy metals, toxic wastes, and toxic materials. The range of environmentally oriented HW research projects is broad -- from microbial to fisheries at the organismal level, from microcosm to reservoir and large rivers at the habitat level, and from LD_{50} determinations to isozyme changes at the physiological level.

Specific research projects have identified bioaccumulation effects of mercury in aquatic systems, the effects of toxics on survival and gill movement in fingernail clams, and the toxicity of ammonia to aquatic organisms under both warm (15-26°C) and cold (3-5°C) water conditions. Innovative techniques for determining toxicity of compounds to aquatic organisms have been developed and used by Survey scientists, including the bluegill toxicity index

and the fingernail clam gill response test. Many of these investigations have led to management recommendations that have resulted in policy changes to protect human and natural resources.

Thus, INHS staff possess the expertise and facilities to address both specific and generic questions relating to mechanisms, cumulative responses at the individual and ecosystem level, and other aspects of HW in nature. Research and support laboratories are equipped for water quality, tissue and organic analyses of selected HW, and toxicological and bioassay studies. These resources are available to HWRIC.

The Illinois State Water Survey is charged with obtaining information on the water resources of the state. The Illinois State Water Survey has been collecting data and conducting research on Illinois water resources, use, treatment, and management since its inception in the late 1800's. Water quality and quantity studies were supplemented by the expansion of Survey activities into atmospheric components of the hydrologic cycle in the 1950's. Survey staff respond to over 5,000 requests per year regarding the development, protection and rehabilitation of ground-water resources. At least seven intensive workshops on the state of the art ground-water hydrology and monitoring techniques have been presented to scientists, engineers and the staffs of other state agencies since 1960.

Historically, the ISWS was involved primarily in the protection of public health through private or public water supplies. This role has been greatly expanded into the areas of air quality, dry and wet deposition quality, surface water quality, ground-water quality, and the treatment of sewage and public water supplies. Considerable research currently is devoted to "state of the art" issues in each category.

Hazardous and solid waste disposal practices have had significant impacts on Illinois' air and water resources. Water Survey staff have responded to the 100 to 200 technical support requests received annually from state agencies, local governments, industry and the public regarding water resource impacts. An active interdisciplinary research program also has been established between the Ground Water and Aquatic Chemistry Sections. These activities are over 80% supported on G/C funds. Ten peer-reviewed journal articles and ten contract reports have been published on both ground water resource contamination and contaminant monitoring techniques in the last five years. Several hazardous waste impact assessment and contaminant transport studies have been completed recently which represent a valuable basis for more detailed studies of Illinois' problems.

Major contractual involvements presently include:

Ground Water Sampling for Monitoring Purposes -- A two-year study concentrated on the evaluation of materials' and sampling mechanisms' effects on the effectiveness of ground-water monitoring methodologies. The project already has had significant impacts on many state and federal (RCRA and CERCLA) ground-water data collection programs. The study will be completed in December of 1984.

Effective Porosity of Geologic Materials --This study, which will extend to September, 1985, is an effort to improve the reliability of field and laboratory methods for the determination of the transport characteristics of soils, clay-liners and aquifer materials.

Illinois Ground Water Monitoring Network --This project is focussed on the evaluation of past data and the study of both optimum design criteria and data base management methods for the establishment of a plan for monitoring principal aquifers at the State level. The study should be completed by October, 1984.

INTEGRATION OF DEPARTMENT RESEARCH ACTIVITIES

HWRIC will be the focal point of ENR's HW-related research, service and information activities. Divisional programs which complement the activities of the Center are detailed in Table 5.2. It should be clear from the table that ENR has a comprehensive range of programs to address HW management policy research and information needs. Current programs supported by both state and grant/contract funds have well developed expertise in research and information activities. The initiation of expanded activities in industrial assistance and engineering and analysis will round out ENR's capabilities to meet legislative mandates, as well as anticipate the future needs of state HW management policy. Since all of HWRIC's activities are closely interrelated, the involvement of all ENR Divisions provides a sound basis for the success of HWRIC programs.

Table 5.2. Divisional Programs Related to HWRIC Activities

DIVISION/Program	HWRIC Activity			
	Information	Research	Industrial Assistance	Engin. and Analysis
EEA				
Hazardous Waste Research	X	X		
Environmental Research	X	X		
Energy Engineering	X		X	X
GS				
Geochemistry	X	X		
Hydrogeology	X	X		
Stratigraphy/Clay Studies	X	X		
Engineering Geology	X	X	X	X
Analytical Chemistry	X	X		X
NHS				
Aquatic Biology	X	X		
Botany	X	X		
Economic Entomology	X	X		X
Wildlife	X	X		
SM				
Research Section	X	X		
WS				
Environmental Chemical Processes	X	X		X
Ground Water Quality and Contamination	X	X		

APPENDIX 1. HWRIC CORE AND DIVISIONAL STAFF POSITION DESCRIPTIONS

POSITION ANNOUNCEMENT
RESEARCH PROGRAM COORDINATOR

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

The Research Program Coordinator will be responsible for the development and implementation of Center research programs directed towards a clear definition of the extent and severity of HW related problems in Illinois. He/She will be expected to be well aware of the corresponding environmental and economic consequences of HW management and disposal operations and to pursue both industrial and government sponsorship of research activities. The Coordinator will report to the Director of the Center, will directly supervise a small staff of research professionals and direct contract research support (> $0.5M) activities with internal and external groups.

Qualifications

The successful candidate will be an experienced scientist with demonstrated research project management skills. An advanced degree (Ph.D.) in a relevant environmental discipline is preferred. The salary range starts at $30,000 to $45,000 per year depending upon the needs of the program.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

The State of Illinois is an Equal Opportunity/Affirmative Action Employer.

POSITION ANNOUNCEMENT
DIRECTOR

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

The Director will be responsible for the management and implementation of Center activities aided by group leaders in the research, information and technical assistance programs. The Director will report to the Chief of the Illinois State Water Survey and the HWRIC Governing Board. Initial tasks include: the evaluation of related activities at the State and Federal level, the development of efficient information clearinghouse and industrial assistance program, supervision of research and facilities planning activities and acting as the principal spokesperson for the program.

Qualifications

The successful candidate will be an accomplished scientific professional with demonstrated experience in the management of a scientific research or service program. An advanced degree in an appropriate discipline is preferred. Salary of $40,000 to $55,000 per year will be commensurate with experience and qualifications.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

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POSITION ANNOUNCEMENT
INFORMATION PROGRAM COORDINATOR

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are sought for the position of Information Program Coordinator. The Coordinator will be responsible for the planning and implementation of HW information clearinghouse and data base development activities of the Center. He/She will report to the Director and actively cooperate with the staff of the research and technical assistance programs. The successful candidate will supervise the information and data management activities of the Center.

Qualifications

Familiarity and experience with bibliographic, information transfer and computer-aided reference needs of an advanced scientific group are essential. Microcomputer literacy would be useful. Technical writing and issue analysis experience are preferred with adequate scientific experience. Salary level for this position is $24,000-$28,000 per annum, negotiable according to experience.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

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POSITION ANNOUNCEMENT
ENGINEER/INDUSTRIAL ASSISTANCE COORDINATOR

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are sought for the position of Industrial Assistance Coordinator. The Coordinator will be an integral part of the management team of the Center, responsible for the development of a comprehensive program of industrial and technical assistance. Initial tasks will include: establishing contact with industry and trade groups involved in HW reduction and alternative treatment programs; preparing reliable procedures for the analysis of materials' flows and auditing to encourage waste reduction, product substitution, process modification and alternatives to HW landfilling. The Coordinator will report directly to the Director of the Center and will be expected to integrate program activities with related research and information efforts.

Qualifications

The successful candidate will be an experienced chemical process or treatment engineer, motivated towards an effective HW management strategy for Illinois' industry. He/She will have demonstrated experience in the management of waste research or service programs which addresses environmental and economic constraints effectively. Salary is $40,000-$50,000 per annum according to experience and the needs of the program.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

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POSITION ANNOUNCEMENT
FISCAL & ADMINISTRATIVE OFFICER

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

This position involves financial oversight for the research and service programs of HWRIC. Initial tasks will involve the development of administrative and accounting procedures, facilitating the support needs of internal and external contractual obligations and aid with the recruitment and location of scientific core staff.

Qualifications

The successful candidate should have demonstrated experience in routine accounting procedures, the handling of personnel matters, financial experience with research contracts, and the willingness to lend their expertise to the advancement of the goals of the Center. The position is budgeted at $24,000 to $28,000 per annum and is negotiable according to experience.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

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POSITION ANNOUNCEMENT
SECRETARY/ADMINISTRATIVE ASSISTANT

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are sought for an experienced executive secretary to assume the position of Administrative Assistant to HWRIC management. Duties will include clerical, word processing and communications coordination for HWRIC core staff.

Qualifications

The successful candidate will have at least five years of related experience with a scientific and engineering group. The salary range starts at $17,000 to $20,000 depending on experience and needs of the program.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
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Closing Date September 30, 1984

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POSITION ANNOUNCEMENT
INDUSTRIAL ASSISTANCE ENGINEER

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are sought for the position of Industrial Assistance Engineer to aid in the development and execution of the technical assistance program of HWRIC. This position is under the responsibility of the Industrial Assistance coordinator, who is responsible for overall program coordination. Initial tasks include a thorough review of the literature on HW stream generation, characteristics and management options with an emphasis on the options of Illinois' industry for alternatives to landfilling. The successful candidate will develop materials' flow estimates, self-audit and direct assistance procedures, as well as an updated data base on Illinois' HW generation in cooperation with Center research and information core staff.

Qualifications

Proven experience in the design and implementation of waste treatment or process engineering schemes are preferred. Excellent communications and writing skills are essential. An advanced degree in civil, chemical or environmental engineering, or a closely related discipline, is required. Salary range is $35,000-$40,000 per year, negotiable according to experience.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

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POSITION ANNOUNCEMENT
TECHNICAL INFORMATION SPECIALIST

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are sought for the position of Technical Information Specialist to aid in the development of a comprehensive hazardous waste information clearinghouse and HW Hotline in the Center. The position involves the collection of published materials on HW issues, as well as technical information for the use of Center research and technical assistance staff. Initial tasks also include the development of a bibliographic data base on HW and the preparation of issue papers for the public and legislature on various issues related to HW management. The position is under the director supervision of the Information Program Coordinator.

Qualifications

The successful candidate should have experience in the data management and information transfer activities of a high level scientific group. Technical writing and communications skills are essential. A degree in library, computer science, or closely related discipline is required. The salary range is $20,000-$25,000 per annum, negotiable according to experience.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

The State of Illinois is an Equal Opportunity/Affirmative Action Employer.

POSITION ANNOUNCEMENT
DATA MANAGEMENT SPECIALIST (2)

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are being sought for two computerized data systems professionals with experience in the provision of the information handling needs of an advanced scientific and engineering group. Initial tasks involve the transfer of waste management, regulatory, economic and demographic data from a variety of mainframe and hard copy sources into a computer system to be established in the Center. Preferred candidates will be experienced in relational data base development, hardware and software interfacing. They will work with a computer systems contractor in the initial design considerations and then have primary responsibility for establishment of the working system.

Qualifications

A degree in computer or basic sciences with appropriate experience (2-3 yrs.) with mainframe/minicomputer systems is preferred. Salary level, $24,000 to $28,000 per annum, negotiable according to experience and the needs of the program

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

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POSITION ANNOUNCEMENT

Research Biologist
Hazardous Waste

Background

The Illinois Department of Energy and Natural Resources (DENR) is developing a Hazardous Waste Research and Information Center (HWRIC). This Center is to be the focus of hazardous waste research and information assistance in Illinois. As a division of DENR, the Illinois Natural History Survey has the major role in addressing biological research issues which relate to hazardous waste problems in Illinois.

Responsibilities

As a member of the HWRIC and the Illinois Natural History Survey, the research biologist will have initial responsibilities in assessing the extent, magnitude, and areal concentration of hazardous waste generation, treatment, and disposal activities in Illinois, with an emphasis on environmental impacts. The position is under the direction of the Aquatic Biology Section Head and reports to the Research Program Coordinator of the Center. The scientist will also identify high-priority problem assessment and problem solving research needs, and conduct research in these topical areas.

Qualifications

Candidates will have a Ph.D. degree in the biological sciences with training and experience in the movement and effects of toxic chemicals in the environment. Preference will be given to candidates with a strong publications record and demonstrated proficiency with electronic data management techniques. The eventual appointment will be made at the Assistant or Associate Professional Scientist level; annual salary is commensurate with qualifications and experience.

Applications

Qualified applicants should submit a letter of application, a resume, and three letters of reference to:

Dr. Robert W. Gorden
Illinois Natural History Survey
607 East Peabody
Champaign, Illinois 61820

Closing Date

September 30, 1984

THE STATE OF ILLINOIS IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.

POSITION ANNOUNCEMENT
RESEARCH SCIENTIST (2)

Background

The Illinois Department of Energy and Natural Resources (ENR), Water Survey Division, is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research information and industrial assistance in Illinois state government. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the state.

Responsibilities

Applications are sought to fill two research staff positions in support of HWRIC problem assessment and problem solving research activities. Each position is under the direct supervision of the Research Program Coordinator. Initial tasks will include an assessment of the extent, magnitude and areal concentration of HW generation, treatment and disposal activities in Illinois, with an emphasis on environmental and economic impacts. Industrial, economic and environmental data must be evaluated from a variety of sources to provide an overview and assess the status of research findings in diverse scientific research efforts in the U.S., of HW related problems towards the development of an effective waste management strategy. In-depth assessments of major waste streams, disposal and treatment practices in regional to local settings will be conducted to better assess the research and technical needs of the state. This will entail the development of relational data bases to integrate existing regulatory and natural resource data pertaining to waste management activity in the past, present and the future.

Qualifications

It is anticipated that each candidate will have at least three years experience and an advanced degree (M.S. preferred) in a basic science (hydrology, chemistry) or engineering (civil, sanitary, environmental) discipline. Research contract involvement particularly in management and cooperative participation would be useful. The successful candidates would be expected to have proven experience in scientific and engineering data base manipulation and solid writing/communication skills. The salary range is $22,000-$27,000 per annum negotiable on experience and how closely the candidate meets the needs of the program. Each applicant should provide a summary of relevant experience and a statement of professional goals.

Applications

Qualified applicants should submit their resumes and three letters of reference to:

Stanley A. Changnon, Jr., Chief
Illinois State Water Survey
P.O. Box 5050, Station A
Champaign, IL 61820

Closing Date September 30, 1984

The State of Illinois is an Equal Opportunity/Affirmative Action Employer.

POSITION ANNOUNCEMENT

Hydrogeologist

Background

The Illinois Department of Energy and Natural Resources (ENR) is developing a Hazardous Waste Research and Information Center (HWRIC). The Center is the focus of hazardous waste research and information and industrial assistance of the five divisions of ENR. It's role is to provide information and technical support to industry, the public and government officials towards a comprehensive hazardous waste management strategy for the State.

Responsibilities

Applications are sought to fill a senior research staff position for a hydrogeologist in support of the activities of the Illinois State Geological Survey (SGS) related to HWRIC problem assessment and problem solving research activities. The position will be within the Hydrogeology Section of the SGS. The position is under the direction of the Section Head and reports to the Research Program Coordinator of the Center. Initial tasks will include research in delineating areas potentially affected by ground-water contamination due to land disposal activities. Existing environmental data from a variety of sources must be evaluated to develop an effective research program to address unresolved issues related to HW management. Duties will include the preparation of proposals for specific research projects, for the management and completion of these projects and the preparation of reports. These research projects may include field, laboratory or theoretical studies requiring that candidates for the position have a strong theoretical background in hydrogeology. Preferred candidates will be capable of conducting field hydrogeologic investigations, theoretical predictive analyses of ground-water flow and contaminant migration.

Qualifications

The candidate should have at least an M.S. degree in geology, hydrogeology or a related discipline and prior experience in conducting hydrogeological investigations. Previous involvement in research studies requiring proposal development, contract management and report preparation would be helpful. The successful candidate will also be expected to have excellent writing and communication skills. Salary range is $24,000-28,000 per year depending on experience. Each applicant should provide a summary of relevant experience and abilities as well as a statement of professional goals related to this position.

Applications

Qualified applicants should submit their resumés and three (3) letters of reference to:

Morris W. Leighton, Chief
Illinois State Geological Survey
615 East Peabody Drive
Champaign, IL 61820

Closing Date
September 30, 1984

THE STATE OF ILLINOIS IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.